ALASKAN COPPER

Dangerous Waste Tank Closure Plan

Tank System Clean Closure
Corrective Action Plan

Prepared by

CleanHarbors
ENVIRONMENTAL SERVICES®

19320 Des Moines Memorial Drive S
Building D, Suite 400
SeaTac, WA 98148

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1.0 Introduction

This Corrective Action Plan (CAP) is for the closure of a passification tank system operated by Alaskan Copper Works (ACW) at 3600 E Marginal Way in Seattle, Washington. The purpose of this tank closure is to,

1. Remove Contaminates of Concern (COC).
2. Decontaminate COC impacted tank system equipment and surfaces.
3. Decontaminate remaining surrounding equipment and structures.
4. Verify decontamination through authoritative sampling.
5. Determine the presence of COC's in subsurface through investigation.
6. Remediate subsurface contamination exceeding MTCA clean up standards.
7. Manage collected and generated solid and liquid wastes.

This plan provides detail regarding performance standards that are to be used to remove hazardous substances from the tank system, related equipment, concrete containment sump, and structural surfaces. A list of tank system components, capacities and material of construction is provided in Section 1.6.

The accompanying Sampling and Analysis Plan (SAP) provides additional information on sampling methodologies, testing parameters and rationale along with sampling quality control measures for the following tank system components.

1. Passification tank
2. Associated tank piping and discharge drains
3. Passification tank containment pad, sump, drains, berming and walls
4. Subsurface soils underneath the tank containment pad.

1.0.1 Regulatory Requirements

The extent of removal is to be consistent with the regulatory requirements of Washington State Department of Ecology Clean Closure of Dangerous Waste Units and Facilities (Publication #94-111 revised May 2005). This plan also references applicable elements for tank closure under WAC 173-303-640(8).

1.1 Facility Contact Information

Clean Harbors Environmental Services has been retained by ACW to serve on its behalf regarding this plan and implementation of closure activities subject to closure under section 1.0.1.

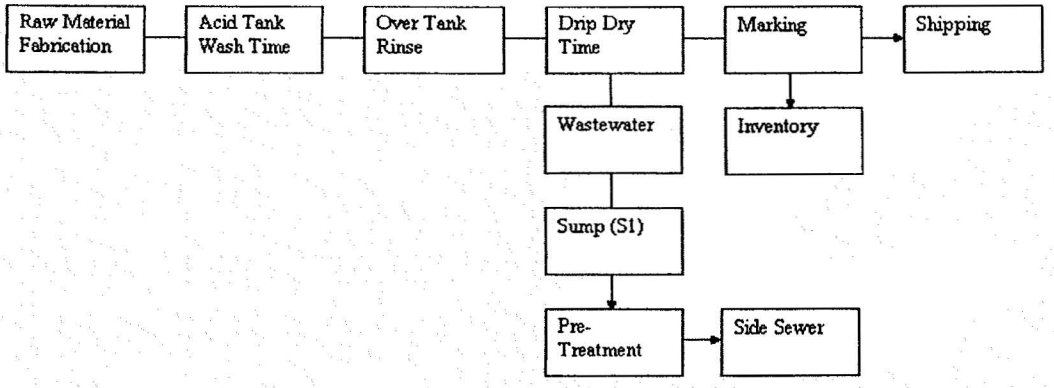
Lead Contact	Shawn Estrada	Contact Numbers
Clean Harbors 19320 Des Moines Memorial Drive S Building D, Suite 400 SeaTac, WA 98148	CHES Project Manager	206-290-0632 estrada.shawn@cleanharbors.com
Clean Harbors 19320 Des Moines Memorial Drive S Building D, Suite 400 SeaTac, WA 98148	CHES Regulatory Interface	503-997-0339 Matthew.dunn@cleanharbors.com

1.2 Facility Description

The facility conducted pipe fabrication activities comprising of cutting, rolling and welding stainless and non-stainless steel pipe. A component of the pipe manufacturing involved the passification of stainless steel pipe sections which would be dipped in a solution of nitric and hydrofluoric acid.

The passification process removes entrained iron giving the steel a high level of corrosion resistance. Rinse water used to wash off the acid solution would be neutralized with dissolved solids removed from the wastewater by precipitation prior to being discharge to the city sanitary system. A diagram of the basic passification and rinse water treatment process is shown in figure 1 below.

Figure 1
Passification and Rinse Water Pre Treatment Process



The types of chemicals used and general waste volumes generated from the passification process are shown in tables 1, 2 and 3.

Table 1
Inventory of New Chemistries

Location	Sub Location	Material	Media	Container	Max Amount	Unit
3600	Acid Yard	Sodium Hydroxide	Liq	55 gallon	110	Gallon
3600 Production	Acid Yard	Nitric solution 10%	Liq	5 gallon	25	Gallon

Table 2
Inventory of Process and Wastewater Pre-Treatment Tanks

Process Tank or System	Size	Building Location	Chemical and Concentration	Slug Spill Prevention Measures
Pacification Tank	3000 g	3600	Nitric Acid 10% Ammonium Bi-fluoride <1%	Secondary Containment 4000 gallons with no floor drains
Treatment Sump	3000 g	3600	Nitric Acid 10% Ammonium Bi-fluoride <1%	Secondary Containment 4000 gallons with no floor drains

Table 3
Inventory of Waste Chemistries

Waste Type	Max Amount	Container	Building Location	Slug Spill Prevention Measures
Treatment Filter Cake Solids	4	275 tote	3600	Secondary Containment of 150% with no floor drains

1.3 Facility History, Function, Location and Layout

ACW owns and maintains a 45,000 ft2 facility on a 1 and ½ acre industrial parcel located at 3600 E. Marginal Way in Seattle, Washington 98134. Pipe manufacturing began at this location in 1961 and ceased in 1993. No plans have been formulated by ACW in respect to the final long term disposition of this site.

Although there have been no industrial discharges at this located for the past 16 years ACW maintains an active industrial wastewater discharge permit with King County.

Figure 2
Site Area Map

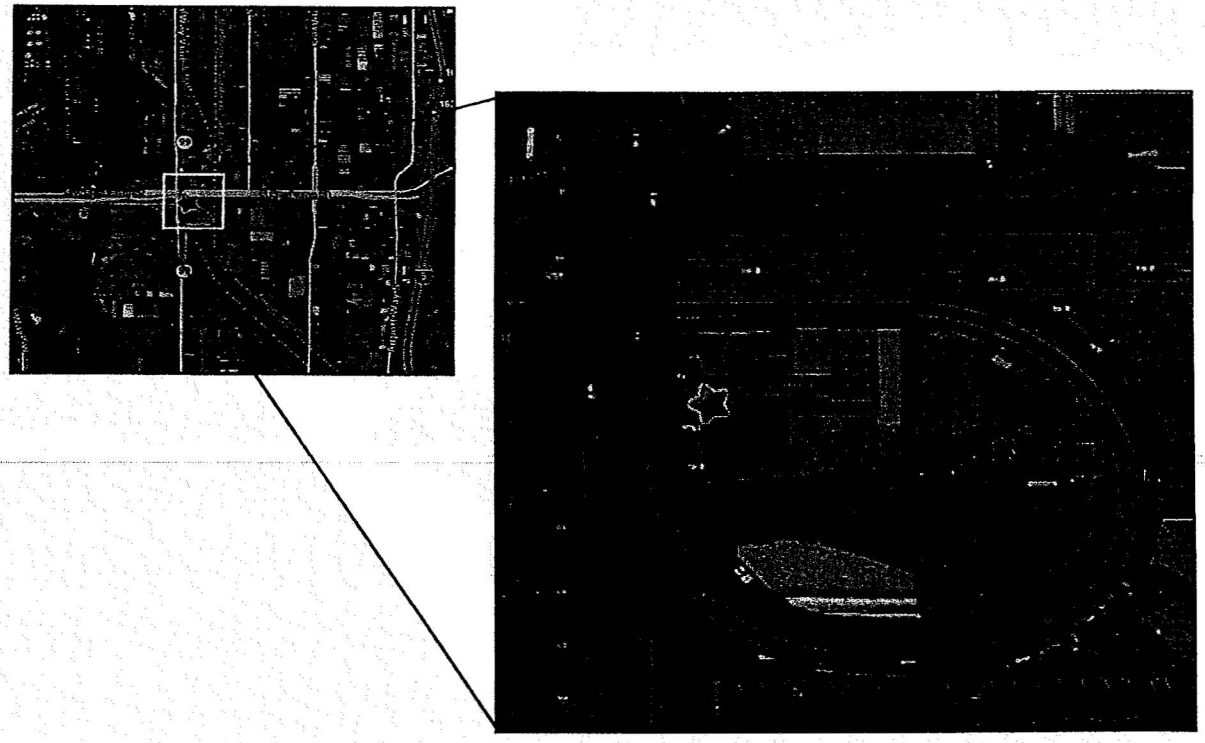
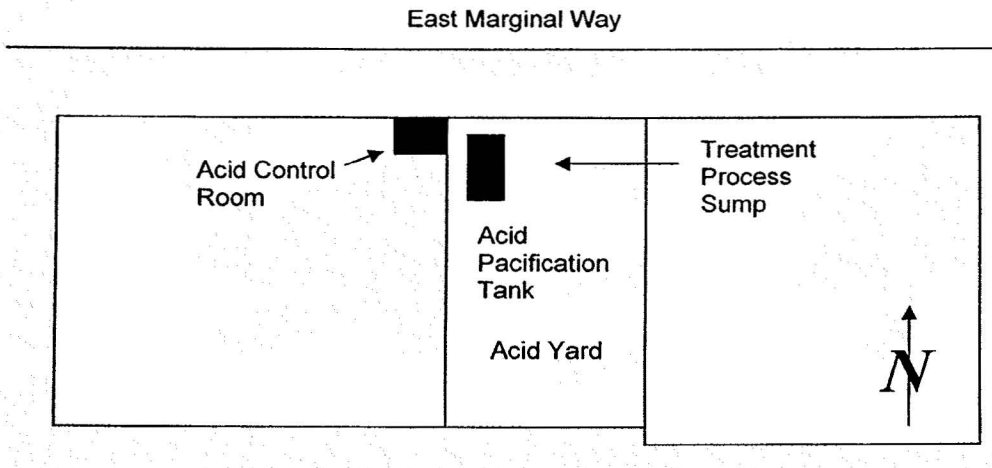


Figure 3
Facility Layout



1.4 Products and Production Processes

No products are currently being produced and no ACW manufacturing processes are being conducted at this location. ACW leases out portions of the facility to small light industrial enterprises. There are no passification chemicals being stored on site.

1.5 Dangerous Waste Management Units

There are two distinct process units identified as meeting the definition of a dangerous waste management unit under WAC 173-303-640 and subject to this closure plan. **Figure 3** above and **Figure 4** below shows the passification tank with lid and containment sump which remained in place after manufacturing ceased in 1993.

Figure 4
Passification Tank and Containment Sump

1.6 Management Unit Description

The waste management units subject to this closure plan are described in section 1.5 of this plan and further described in **Table 4** below.

Table 4
List of Management Units Subject to Closure Plan

Unit ID	Description	Chemical	Material
Unit 1	3,600 Gallon Passification Tank	Nitric and HF	Steel/Fiberglass
Unit 2	3,600 Gallon Containment Sump	Dilute Nitric and HF	Concrete

1.6.1 Maximum Waste Inventory

The maximum combined amount of waste that could be present in the passification tank is 3,600 gallons with an addition 200 gallons comprising of nitric and HF acid rinse and pre-treated waste water contained in associated piping and treatment vessels. The passification tank containment sump has a total capacity equal to that of the tank or 3,600 gallons.

2.0 Closure Performance Standards

Closure performance standards applicable to the tank system and consistent with WAC 173-303-640(8) are as follows.

1. Minimize the need for further maintenance.
2. Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of dangerous waste, dangerous constituents, contaminated run-off, or dangerous waste decomposition products to the ground, surface water, ground water, or to the atmosphere.
3. Removal of all waste and waste residues and properly dispose of them off site.
4. Decontamination of the tank, piping, and other items that make up the former passification process units and properly dispose of waste chemistries and contaminated materials to below minimum industrial site standards under WAC 173-340-704 MTCA Method A.
5. Decontamination of the containment sump and properly dispose of waste chemistries and contaminated materials.
6. For the decontamination of concrete secondary containment sump exhibiting presence of heavy metals or acid salts from sampling and analysis, ACW will implement site-specific standards for decontaminating concrete consistent with Site-Specific Decontamination Methods on pages 18-19 of Ecology's "Guidance for Clean Closure of Dangerous Waste Units and Facilities," Publication #94-111, revised May 2005 and to below minimum industrial site standards under WAC 173-340-704 MTCA Method A.

7. Perform concrete sampling and analysis to ensure exposed surfaces in the containment area meet appropriate MTCA cleanup levels for industrial site use, and remove any contamination above these levels. Use of EPA debris standards under 40 CFR 268.45 Table 1

Table 2 below lists specific performance standards for each management unit identified in section 1.6 as well as additional site locations identified during closure.

Table 5
Management Unit Performance Standards

Unit ID	Description	Standard
Unit 1	3,600 Gallon Passification Tank	• Meet MTCA industrial soil standards for total metals, Cr+6, Fl/Cl, and Bioassy • EPA Debris Standards*
Unit 2	3,600 Gallon Containment Sump	• Meet MTCA industrial soil standards for total metals , Cr+6, Fl/Cl, and Bioassy • EPA Debris Standards*
Misc.Eq and other locations	Boiler room and surrounding tank system surfaces out to 4 linear feet.	• Meet MTCA industrial soil standards for total metals, Cr+6, Fl/Cl, and Bioassy • EPA Debris Standards*

Specific EPA testing methodologies, and detection limits are described under the Sampling and Analysis Plan (SAP).

* "Pass" indicates that each surface has passed visual inspection; that is, each surface, when viewed without magnification, is free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area. [ref 40 CFR 268.45 Table 1]

3.0 Closure Activities and Methodologies

The following closure activities are to be performed using procedures found in section 3.1 through 3.9.

1. Tanks System Waste Removal and Decontamination
2. Tank System Containment Waste Removal and Decontamination
3. Miscellaneous Tank System Decontamination
4. Tank System Verification Sampling and Testing
5. Waste Transportation and Disposal Management
6. Closure Reporting

3.1 Tanks System Waste Removal and Tank Decontamination

1. The tank, containment and sump, equipment and surrounding surfaces will be inspected for chemical release from past processing including surface cracking pitting, staining or evidence of severe corrosion that may have resulted in spillage or migration of process chemistries to underlying soil or storm drains. Inspection will include using wetted pH paper to determine the presence of acid salts. Field testing results recorded in a daily work log by the project manager.

2. Cracks and drains will be sealed using berming, plugs, caulking or quick set mortar to prevent further penetration of contamination during closure activities.

3. The tank and containment pad will be emptied of collectable liquid and solids waste which will be dispensed into DOT approved shipping containers.

4. Waste containers will be staged in a secured secondary contained area pending analysis then shipped under a uniform hazardous waste manifest or BOL based on characterization results.

5. The tank system containment area will be isolated from exterior surfaces using plastic sheeting and temporary berming materials to prevent release of contamination or decontamination solutions from migrating outside of the physical tank system containment pad

6. Interior tank and lid surfaces will be neutralized using a liquid sodium bicarbonate solution or similar non reactive buffering agent and allowed to soak for at least 15 minutes. The tank interior and lid will then be pressure washed using a non phosphate detergent and pumped into DOT approved shipping containers. A final clean rinse will be applied and pumped into DOT approved shipping containers.

7. The tank will then be lifted and bottom of the tank inspected for cracks or loss of integrity.

8. The tank and tank lid exterior surfaces will be neutralized using a liquid sodium bicarbonate solution or similar non reactive buffering agent and allowed to soak for at least 15 minutes. The tank exteriors and lid will then be pressure washed using a non phosphate detergent to be collected in the containment pad and pumped into DOT approved shipping containers. A final clean rinse will be applied to the tank surface and pumped into DOT approved shipping containers.

9. A sample of the final rinse water from exterior tank surfaces will be collected and sampled for parameters indicated in the SAP.

10. Decontamination water used to clean exterior tank surfaces will be pumped directly from the underlying containment pad and dispensed directly into DOT approved shipping containers.

11. After the tank is dry it will then be removed from position and placed onto a temporary containment pad erected adjacent to the tank system pad.

12. Waste containers will be staged in a secured secondary contained area pending analysis then shipped under a uniform hazardous waste manifest or BOL based on characterization results.

3.2 Tank System Containment Waste Removal and Decontamination

1. The tank containment pad will be emptied of collectable liquid and solids waste which will be dispensed into DOT approved shipping containers.

2. After removal of the tank, the containment pad, sump and drains will be re-inspected for evidence of past spillage from the tank including surface cracking pitting or evidence of severe corrosion that may have resulted in release of contamination to underlying soil. Inspection will include using wetted pH paper with results recorded in a daily work log by the project manager.

3. All cracks and any drains will be sealed using berming, plugs, caulking or quick set mortar to prevent further penetration of contamination during closure activities.

4. The containment pad and walls, berms and sump along with concrete surfaces out 6 feet from the containment pad will be pressure washed using a non phosphate detergent and pumped directly into DOT approved containers. A final clean rinse will be applied and pumped into DOT approved shipping containers.

5. Waste containers will be staged in a secured secondary contained area pending analysis then shipped under a uniform hazardous waste manifest or BOL based on characterization results.

3.3 Miscellaneous Non Related Tank System Decontamination

1. Items including tank feed, supply, return, or drain lines will be demolished and dispensed into DOT approved containers for off site disposal based on characterization or decontaminated using a pressure washer with non phosphate detergent followed by a clean rinse.

2. This section also covers any equipment, materials or surfaces located near the tank system that has been found to have chemical tanks, chemical containment areas, or locations where the potential for chemical impact from past practices. The same methodology used for the tank system will apply to all other equipment, materials or locations.

3. All decontamination activities for miscellaneous tank equipment or materials will be conducted inside the tank containment pad.

4. Spent decontamination solution and rinsate will be pumped into DOT approved shipping containers

5. Waste containers will be staged in a secured secondary contained area pending analysis then shipped under a uniform hazardous waste manifest or BOL based on characterization results.

3.4 Tank System Verification Sampling and Testing

1. A single final rinsate sample will be collected from the tank interior to determine satisfactory decontamination. Sampling methodology, location and testing parameters are found in the SAP.

2. A single final rinsate sample will be collected from the tank interior to determine satisfactory decontamination. Sampling methodology, location and testing parameters are found in the SAP.

3. A single final rinsate sample will be collected from the containment pad surface to determine satisfactory decontamination. In addition two chip samples will be collected from the containment pad. Sampling methodology, location and testing parameters are found in the SAP.

3.5 Subsurface Investigation

1. Three (3) grab samples will be collected from soil located directly underneath the containment pad and sump.

2. Three (3) grab samples will be collected from soil located approximately 1 foot below the containment pad sub-grade directly underneath the containment pad.

3. Three (3) grab samples will be collected from soil located approximately 2 foot below the containment pad sub-grade directly underneath the containment pad.

4. Three (3) grab samples will be collected from soil at a site location known not to be associated with the tank system for purposes of providing background subsurface information.

5. Sampling methodology, location and testing parameters are found in the SAP.

3.6 Waste Transportation and Disposal Management

1. All collected and accumulated wastes will be properly characterized, placed into DOT approved containers and shipped under uniform hazardous waste manifests to an ACW approved and EPA permitted TSDF.

2. The TSD considered for receipt of waste collected or generated from closure activities is Clean Harbors Environmental Services at:

   Gassy Mountain UT
   Deer Park, TX
   Aragonite, UT

3. Waste identification, labeling, transportation, and disposal will be in compliance with applicable requirements under WAC 173-303-070, WAC 173-303-230, WAC 173-303-180, WAC 173-303-190, WAC 173-303-240, WAC 173-303-250 and WAC 173-303-141.

3.7 Closure Completion

1. When closure is complete the tank system and its associated equipment and piping will be removed and properly disposed of off site or (if decontamination objectives are met) will be left on site with decontamination certification notifications affixed.

2. The concrete containment pad and associated structures will be decontaminated and left in place if decontamination objectives are met or demolished and shipped off site based on characterization of demolition materials.

3. Any miscellaneous equipment and materials discovered on site during closure work and deemed subject to closure work will be characterized, decontamination or disposed of and reported along with all other items subject to the closure plan.

4. Subsurface remediation work, if required will be conducted under a separate work plan submitted to Ecology prior to commencement and consistent with MTCA clean up standards.

3.8 Closure Reporting and Certification of Clean Closure

ACW will provide the following method of certification for Clean Closure.

1. A final written closure report will be submitted to Ecology to include a description of all closure activities, daily records and field logs, decontamination verification testing results, disposition and disposal records for all decontaminated management units, and all sampling and testing supporting documentation and associated field and laboratory quality control and assurance documentation include site photography.

2. Within 60 days of closure of the management unit, ACW will submit to Ecology, by registered mail, certification that the tank system has been closed in accordance with this closure plan. The following certification will be signed by a managing officer of the company.

I certify under penalty of the law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing of violations.

4.0 Closure Schedule

Notification of intent to close was submitted to Ecology on June 21, 2009.

ACW will complete closure activities in accordance with this plan within 45 days from date of notification.

ACW will submit closure certification to Ecology within 30 days following completion of closure activities.

5.0 Role of the Independent Qualified Registered Professional Engineer

An independent qualified registered professional engineer will not be required for purposes of certifying clean closure.

6.0 Closure Cost Estimate

A closure cost estimated is not required for purposes of tank system closure.

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Tank System Clean Closure Sampling and Analysis Plan

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1.0 Introduction

This Sampling and Analysis Plan (SAP) provides procedures and methods for sampling, sample handling and custody, record keeping, use of sampling equipment, laboratory testing, and data quality objectives.

The sampling procedures presented in this SAP are designed to ensure that:

- All samples collected at the site are consistent with project objectives;
- Samples are identified, handled, and transported in a manner that does not alter the representative data from the actual site conditions;
- Quality assurance objectives for sample collection are met;
- Data precision goals are achieved by submitting appropriate duplicate samples (Field duplicates should be between 5 and 10 percent of the total number of samples);
- Laboratory duplicate measurements will be carried out on at least five percent of all laboratory samples. Analytical procedures will be evaluated using the protocols of the analytical laboratory. These protocols can be submitted upon request; and
- Chain-of-custody procedures are followed.

This SAP describes all sampling anticipated during closure, including sampling of potentially affected soils should investigation under the CAP Section 3.7 determine the presence of contaminated media.

2.0 Sampling Rationale

Sampling rationale is based on process knowledge and testing of chemical residues for purposes of waste profiling for off site disposal.

Verification sampling will be taken of the final rinsate from tank and tank containment surface decontamination will demonstrate a level of cleanliness aimed at eliminating a human health risk by direct contact with tank or tank system surfaces.

Verification sampling of the tank containment pad and sump surfaces will determine the presence of contamination in concrete surfaces that may be used again or demolished at a later date.

Sampling the subsurface underneath the tank system will determine if past passification activities impacted site soils and groundwater quality.

3.0 Field and Off Site Laboratory Verification Testing

Field testing to be conducted at this site is for surface pH using 0-14 strip paper.

All other verification testing will be conducted at a Washington State certified independent laboratory.

Site locations where surface sampling has occurred will be documented and added to the closure report submitted after completion of closure.

4.0 Sampling Types and Methodologies

Chemistries stored or used at the Facility include new and spent antifreeze, oil, paints, aerosol flammable solvents and corrosives. All chemistries at the Facility were stored or used at well defined and controlled areas and the sampling types are based on how and where chemical contamination may have impacted surfaces.

4.1 Volumetric Sampling

Volumetric or "Grab" samples will be collected from waste residuals found on surfaces when quantities are sufficient for testing purposes.

All sample containers will be pre-clean and prepared by an independent laboratory. Nitrile gloves will be used when handling sample containers and sampling equipment. All sampling equipment will be made of stainless steel and pre-cleaned using an approved cleaning detergent followed by a DI water rinse. New gloves and pre-clean sampling containers and equipment will be used for each sample.

Waste liquid and debris samples will be collected into plastic jars only due to the possible presence of hydrogen fluoride acid or acid salts.

For direct push subsurface sampling, soil samples will be removed from the sampling device, sealed with Teflon tape, capped, labeled, and placed in a pre-chilled ice chest. Samples from other sampling techniques will be placed into appropriate laboratory pre-cleaned sample containers, and placed in a pre-chilled ice chest.

If a sample of soil cannot be obtained at the exact location required because of boulders, loose sands, or other unfavorable conditions, a sample will be collected at a location adjacent to the prescribed location. Duplicate soil samples may be collected by dividing the sample.

4.2 Chip Sampling

Chip sampling will be performed on areas with porous surfaces such as asphalt, concrete, or wood. Chip samples will be obtained by chiseling out the top 2 cm of a 10 cm x 10 cm area and will represent an area of no more that 100 m2.

The chip samples will be placed into appropriate laboratory pre-cleaned sample containers. All sample containers will be pre-clean and prepared by an independent laboratory.

Nitrile gloves will be used when handling sample containers and sampling equipment. All sampling equipment will be made of stainless steel and pre-cleaned using an approved cleaning detergent followed by a DI water rinse. New gloves and pre-clean sampling containers and equipment will be used for each sample.

Wipe sampling will be performed on areas with smooth and impervious surfaces such as metal tanks, metal buildings, and epoxy coated concrete. Wipe samples will be obtained by using laboratory prepared sterile gauze pads that are pre-moistened with de-ionized water or approved solvent. The sampling material will be held using nitrile gloves and will be stroked across the surface with firm even pressure first vertically then horizontally.

Wipe samples size will typically be 100 cm2 and will represent an area of no more than 100 m2. The wipe samples will be transferred into appropriate laboratory-supplied clean sample containers.

4.3 Rinsate Sampling

All sample containers will be pre-clean and prepared by an independent laboratory.

Nitrile gloves will be used when handling sample containers and sampling equipment. All sampling equipment will be made of stainless steel and pre-cleaned using an approved cleaning detergent followed by a DI water rinse. New gloves and pre-cleaned sampling containers and equipment will be used for each sample.

Liquid samples will be collected by pouring the final rinsate directly into the sample container. The sample container should be filled completely, excluding any headspace, and with a minimum of aeration. If transfers between containers, such as beakers or flasks, are required, these will be minimized to the extent possible.

Samples of wash water in tanks will be collected using a dipper as described in Chapter 9 of EPA SW-846 3rd edition, 1986.

5.0 Verification Sampling Testing Parameters, Frequency and Locations

Sections 5.1 through 5.3 describes what specific testing is to be performed, frequency of sampling and where samples are to be collected.

5.1 Verification Sampling Test Parameters

Based on historical use of specific chemistries samples will be collected and tested for the following analytes listed in Table 6 below. Tables 8 and 9, found on page 19, show applicable MTCA soil clean standards for residential and industrial sites.

Table 6
List of Closure Performance Standards Test Parameters

Analyte	Test method
Total metals (arsenic, barium, cadmium, chrome, lead, mercury, selenium, silver, copper, zinc)	EPA 6010/ 7470A
Chrome IV	EPA 7199
Total Fluoride	EPA 0300.0
Total Chloride	EPA 0300.0
Total Nitrates	EPA 0300.0
pH (50% water added to solid samples)	EPA 9045D

5.2 Sample Location, Type and Frequency

Sample location and frequency is subject to change based on actual site condition encountered. Changes in sampling frequency will be recorded in the daily log with explanation for cause and frequency of samples actually collected.

Frequency of samples for each testing parameter is indicated in table 7 located on the following page.

Table 7
Location, Type and Frequency of Samples

Location	Sample Type	Total Metals	Cr+6	Fl/CL	pH
Tank Interior	Rinsate	1	1	1	1
Tank Exterior	Rinsate	1	1	1	1
Tank Containment	Rinsate	1	1	1	1
Tank Containment	Chip	2	1	1	1
Subsurface (under pad)	Grab	3	3	3	3
Subsurface (1 foot bsg)	Grab	3	3	3	3
Subsurface (3 ft bsg)	Grab	3	3	3	3
Subsurface background (1 foot bsg)	Grab	2	2	2	2

Table 8

Method A Soil Cleanup Levels for Unrestricted Land Uses.[a]

Hazardous Substance	CAS Number	Cleanup Level
Arsenic	7440-38-2	20 mg/kg[b]
Benzene	71-43-2	0.03 mg/kg[c]
Benzo(a)pyrene	50-32-8	0.1 mg/kg[d]
Cadmium	7440-43-9	2 mg/kg[e]
Chromium		
Chromium VI	18540-29-9	19 mg/kg[f1]
Chromium III	16065-83-1	2,000 mg/kg[f2]
DDT	50-29-3	3 mg/kg[g]
Ethylbenzene	100-41-4	6 mg/kg[h]
Ethylene dibromide (EDB)	106-93-4	0.005 mg/kg[i]
Lead	7439-92-1	250 mg/kg[j]
Lindane	58-89-9	0.01 mg/kg[k]
Methylene chloride	75-09-2	0.02 mg/kg[l]
Mercury (inorganic)	7439-97-6	2 mg/kg[m]
MTBE	1634-04-4	0.1 mg/kg[n]
Naphthalenes	91-20-3	5 mg/kg[o]
PAHs (carcinogenic)		See benzo(a)pyrene[d]
PCB Mixtures		1 mg/kg[p]
Tetrachloroethylene	127-18-4	0.05 mg/kg[q]
Toluene	108-88-3	7 mg/kg[r]

Table 9

Method A Soil Cleanup Levels for Industrial Properties.[a]

Hazardous Substance	CAS Number	Cleanup Level
Arsenic	7440-38-2	20 mg/kg[b]
Benzene	71-43-2	0.03 mg/kg[c]
Benzo(a)pyrene	50-32-8	2 mg/kg[d]
Cadmium	7440-43-9	2 mg/kg[e]
Chromium		
Chromium VI	18540-29-9	19 mg/kg[f1]
Chromium III	16065-83-1	2,000 mg/kg[f2]
DDT	50-29-3	4 mg/kg[g]
Ethylbenzene	100-41-4	6 mg/kg[h]
Ethylene dibromide (EDB)	106-93-4	0.005 mg/kg[i]
Lead	7439-92-1	1,000 mg/kg[j]
Lindane	58-89-9	0.01 mg/kg[k]
Methylene chloride	75-09-2	0.02 mg/kg[l]
Mercury (inorganic)	7439-97-6	2 mg/kg[m]
MTBE	1634-04-4	0.1 mg/kg[n]
Naphthalene	91-20-3	5 mg/kg[o]
PAHs (carcinogenic)		See benzo(a)pyrene[d]
PCB Mixtures		10 mg/kg[p]
Tetrachloroethylene	127-18-4	0.05 mg/kg[q]
Toluene	108-88-3	7 mg/kg[r]

RESERVED SECTION

5.3 Sampling Locations

Bias sampling locations will be collected from each tank and metal and concrete surfaces based on locations most likely to exhibit contamination from standard and normal processing practices.

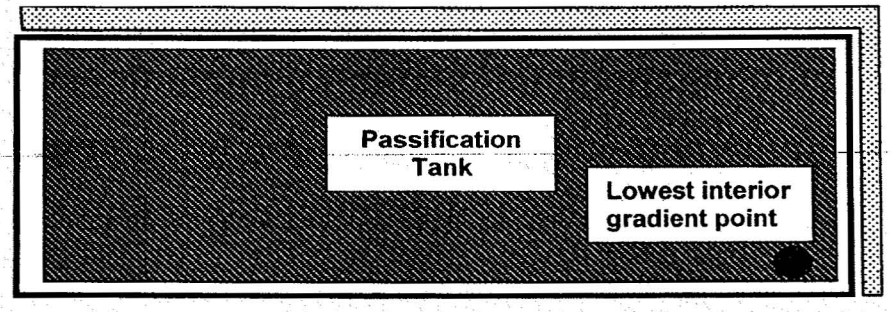
Samples collected on the containment pad and sump will be positions showing discoloration or staining after cleaning or the lowest gradient.

Subsurface samples will be collected from points underneath the concrete containment pad below exposed cracks or pitted area or lowest gradient.

5.3.1 Sampling Locations for Tank Interior

Sampling location for tank interior sample collection will be from the lowest point as shown in **Figure 5** below.

Figure 5
Tank Interior Rinsate Sampling Location

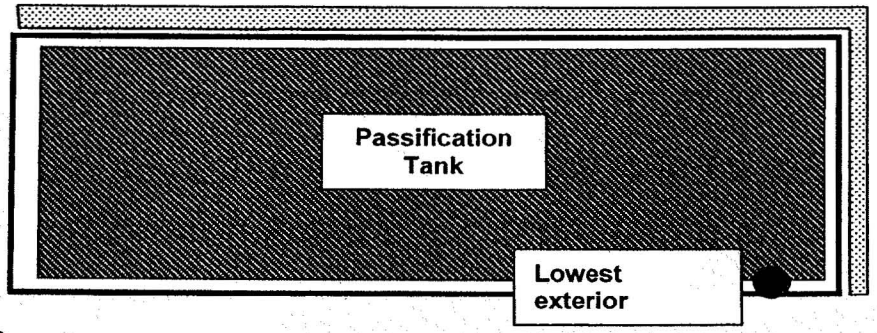


● Sample Point

5.3.2 Sampling Locations for Tank Exterior

Sampling location for tank exterior will be from the lowest point as shown in **Figure 6** below. Rinsate will be collected directly into sampling containers as the final rinsate is allowed to run off from highest to lowest exterior surfaces.

Figure 6
Tank Exterior Rinsate Sampling Location

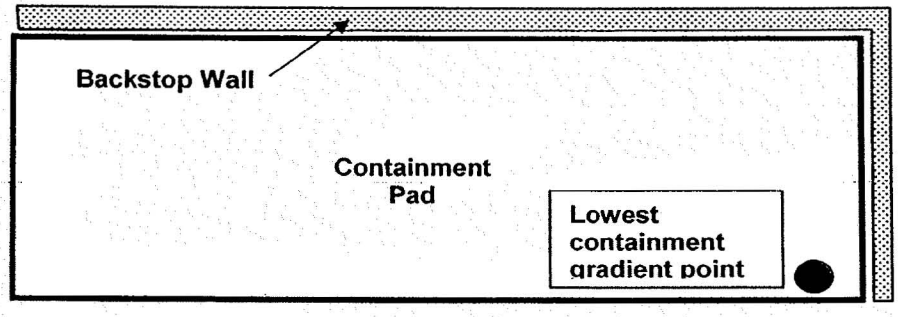


● Sample Point

5.3.3 Sampling Locations for Tank Containment Pad

Sampling location for containment pad will be from the lowest point as shown in **Figure 7** below. Rinsate will be drawn into sampling containers collected directly into sampling containers. Final rinsate source will include containment pad backstop wall.

Figure 7
Tank Containment Pad and Sump Rinsate Sampling Location

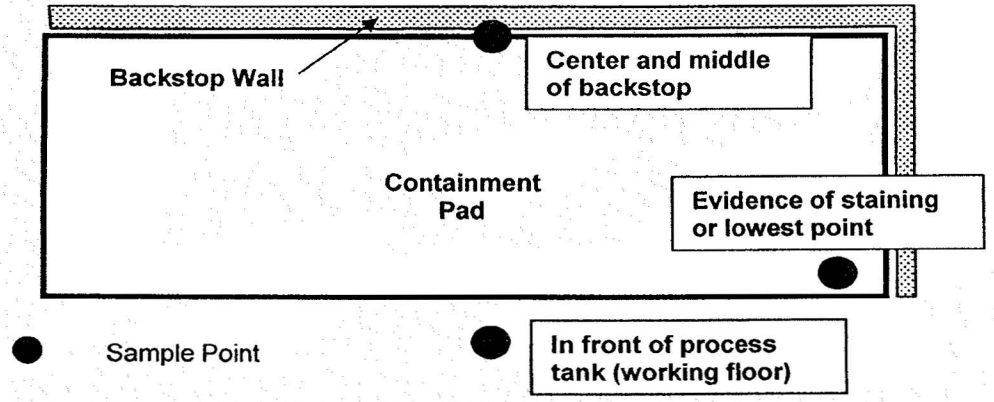


● Sample Point

5.3.4 Tank System Containment Pad

Bias grab subsurface samples will be collected from the concrete containment pad, halfway up and center of the backstop wall and process floor immediately in front of the process tank **(See figure 8 below).** Exact sampling locations will be based on evidence of most significant concrete staining, discolorization, or if lacking visual indication, at a low gradient location along a concrete joint where liquids might have accumulated and seeped underneath the concrete pad.

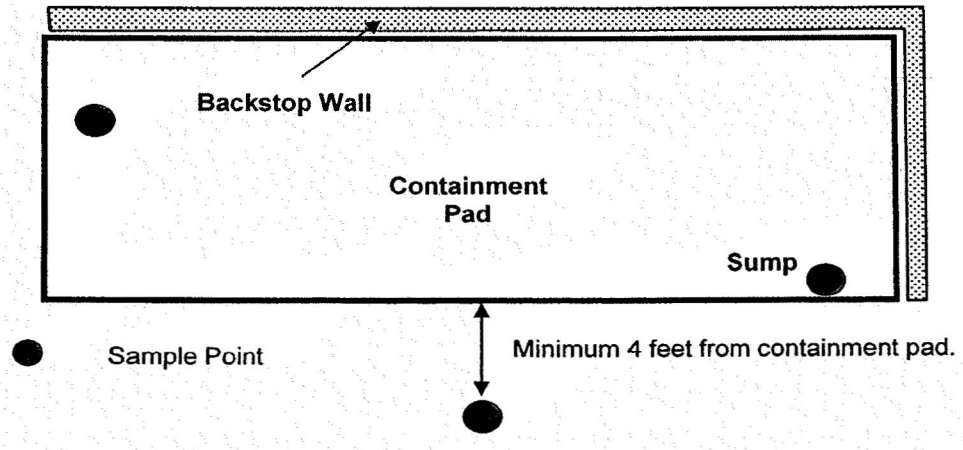
Figure 8
Sampling Locations for Concrete Surfaces



5.3.5 Tank System Subsurface

Discrete subsurface soil samples will be collected by first coring through existing concrete followed by direct hand push into a core tube. A power auger or push geoprobe will be used for the second and third level sampling efforts.

Figure 9
Subsurface Sampling Locations for Subsurface



6.0 Quality Assurance Plan and Objectives

The general quality assurance objective for this project is to develop and implement procedures for obtaining and evaluating quality data that can be used to assess the nature and extent of contamination and to assess potential risks associated with hazardous substances at the site (i.e., risk assessment). Therefore, analytical data must have an appropriate degree of accuracy and reproducibility, be representative of actual field conditions, and be collected and analyzed following established chain-of-custody procedures. This SAP specifies procedures and methods for office and field documentation, sample handling and custody, record keeping, equipment handling, laboratory analyses, and data quality objectives.

The sampling procedures presented in this plan are designed to ensure that:

1. All samples collected at the site are consistent with project objectives;
2. Samples are identified, handled, and transported in a manner that does not alter the representative data from the actual site conditions;
3. Quality assurance objectives for sample collection are met;
4. Data precision goals are achieved by submitting appropriate duplicates samples (Field duplicates should be between 5 and 10 percent of the total number of samples);
5. Laboratory duplicate measurements will be carried out on at least five percent of all laboratory samples. Analytical procedures will be evaluated using the protocols of the analytical laboratory. These protocols can be submitted upon request; and;
6. Chain-of-custody procedures are followed.

Analytical data must have an appropriate degree of accuracy and reproducibility, be representative of actual field conditions, and be collected and analyzed following established chain-of-custody procedures. The quality of the data collected during this investigation will be evaluated by estimating data precision, accuracy, representativeness, completeness, and comparability parameters.

Precision

Precision is a measure of the reproducibility of data under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. For duplicate measurements, precision can be expressed as the relative percent difference (RPD). Analysis of field duplicate samples will serve to measure the precision of sampling. Field and laboratory duplicate measurements will be carried out with approximately a ten percent frequency for groundwater and five percent frequency for laboratory samples.

Accuracy

Accuracy is the measure of error between the reported test results and the true sample concentration. True sample concentration is never known due to analytical limitations and error. Consequently, accuracy is inferred from the recovery data from spiked samples. Because of difficulties with spiking samples in the field, the laboratory will spike samples. The laboratory shall perform sufficient spike samples of a similar matrix (water) to allow the computation of the accuracy. For analyses of less than five samples, surrogate spikes may be performed on a batch basis.

Representativeness

Representativeness is a measure of how closely the results reflect the actual concentration of the chemical parameters in the medium sampled. Sampling procedures, as well as sample-handling protocols for storage, preservation, and transportation are designed to preserve the representativeness of the samples collected. Proper documentation will confirm that protocols are followed. This helps to assure the sample identification and integrity. Laboratory method blanks will be run in accordance with established laboratory protocols.

Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is essentially that a sufficient amount of valid data be generated to allow for the evaluation of site risk or cleanup actions.

Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The objective of this QAP is to assure that all data developed during the investigation are comparable.

Comparability of the data will be assured by using EPA defined procedures that specify sample collection, handling, and analytical methods. The comparability of past data will be evaluated during the investigation, if possible, by assessing the techniques used for sample collection and analysis.

7.0 Field Quality Assurance and Control

Field Sample Nomenclature

All samples should be identified with a unique sample number that will identify the location, sample matrix, and date of the sample. All sampling locations should be identified on a site map and located by measuring the distance between sample location and at least two (2) fixed on-site locations (e.g., telephone pole, building wall, monitor well)

Sampling Equipment and Materials

All sampling will be conducted using pre-cleaned digging and sampling devices. New nitrile gloves are to be used during each sampling. Samples are to be collected in pre-cleaned bottles.

Field Duplicates

A field duplicate is defined as a second sample, or measurement, from the same location, collected in immediate succession, using identical techniques. Duplicate samples are sealed, handled, stored, shipped, and analyzed in the same manner as the primary sample. Precision of duplicate results is calculated by the relative percent difference (RPD) as defined by 100 times the difference (range) of each duplicate set, divided by the average value (mean) of the set.

Duplicate samples will be collected randomly for every 3 samples collected. If less than three samples are taken, there will be one random duplicate per day of collection.

Field Blanks

Field blanks are de-ionized water samples that are run through sampling equipment after the equipment has been cleaned. These field blanks are handled and analyzed the same way as other field samples. Collect field blanks if sampling equipment is cleaned in the field for re-use.

Trip/Travel Blanks

Trip or travel blanks evaluate potential sample contamination from volatile organic compounds (VOCs) that may be present in the air, on-site or in sample shipping containers. A trip blank consists of laboratory distilled, de-ionized water in a closed container. The blank accompanies the empty sample bottles to the field as well as the samples returning to the lab for analysis; it is not opened until the lab analyzes it with the actual site samples. A trip blank will be prepared by the sample laboratory and analyzed upon return for each sampling event.

Sample Container Labeling

A sample label will be affixed to each sample container before sample collection. The information to be included on each sample label is as follows:

1. Type of analysis
2. Name of facility
3. Monitoring point identification
4. Name of person collecting the sample
5. Time and date the sample was collected; and,
6. Whether a preservative was added to the sample or the sample was filtered

Sample Container Seals

Sample seals are generally not necessary when samples are delivered directly to the lab by the sampler. When samples have been shipped or arrive at the laboratory after hours, seals shall be affixed to the sample container(s).

Sample Preservation

The Quality Assurance/Quality Control Plan needs to specify the analytical methods, sample containers, preservatives, and holding times to be achieved. **Table 10** on the next page shows specific test methods, associated preservation, and holding times for all investigative and verification samples.

Table 10
Sample Container Preservation and Holding Times

Analyte/Method	Sample Matrix	Sample Container	Preservation	Maximum Holding Time
Metals (SW-846 Method 6010)	Solid	8-ounce clear wide mouth glass bottle	HNO_3 to pH < 2	6 months
Metals (SW-846 Method 6010)	Liquid	1-liter high density polyethylene bottle	HNO_3 to pH < 2	6 months
Fluoride/Chloride/Nitrate	Liquid/Solid	4-ounce clear wide mouth glass bottle	Cool to 4°C	6 months
pH	Solid	4-ounce clear wide mouth glass bottle	Cool to 4°C	6 months

Field Logs

All pertinent sampling information is to be recorded so that the sampling process can be reconstructed from the field log without reference to memory or other notes. The field log needs to be kept secured and made part of the work record.

The field log needs to contain the following data.

1. Date, time and location of sampling work
2. Type, number and volume of samples collected
3. Sample(s) ID
4. Suspected contaminants
5. Description of sampling point(s) or depth
6. Means of sample preservation
7. References to drawings, grid points, maps, etc. (site sketch)
8. Field observations such as color, odor, soil characteristics, etc.
9. Field measurements taken such as pH, ignitibility, etc.
10. Signatures of personnel taking data

Sample Custody

All shipments are accompanied by Chain of Custody form. This form identifies contents of the sample shipment. The information to be entered on the chain of custody form includes: site location, sample numbers, sampling date and time, preservative used, analyses required, and signature of sampler.

Sample chain-of-custody refers to the process of tracking the possession of a sample from the time it is collected in the filed through the laboratory analysis. A sample is considered to be under a person's custody if:

1. It is in a person's physical possession;
2. In view of the person after possession has been taken; or
3. Secured by that person so that no one can tamper with the sample or secured by that person in an area that is restricted to authorized personnel.

A chain-of-custody form is used to record possession of a sample and to document analyses requested. Each time the sample bottles or samples are transferred between individuals. Both the sender and receiver sign and date the chain-of-custody form. When a sample shipment is transported to the laboratory, a copy of the chain-of-custody form is included in the transport container (i.e. ice chest).

The chain-of-custody forms are used to record the following information:

1. Sample identification number
2. Sample collector's signature
3. Date and time of collection
4. Description of sample
5. Analyses requested
6. Shipper's name and address
7. Receiver's name and address; and
8. Signatures of persons involved in chain-of-custody

Corrections to Documentation

All originally recorded field logs, chain-of-custody records, and other forms are to be written in waterproof ink. None of these documents shall be destroyed or altered. If an error is made on a document, a single line shall be made through the error and initialed by the original writer, and correct information entered.

Shipping Requirements

Samples will be transported as rapidly as possible (24 hours) to the receiving laboratory. Samples will be maintained at or about 4 degrees Celsius during shipment. All EPA, DOT and OSHA material handling and transportation compliance shall be maintained throughout the chain of possession.

Equipment Calibration and Maintenance

All instruments and equipment used during this project will be operated, calibrated and maintained according to the manufactures guidelines and recommendations. Personnel who have been properly trained in those procedures shall perform the operation, calibration and maintenance. Instruments that fail within established performance limits are to be removed from use until proper maintenance/repairs have been performed and have been demonstrated to be accurate.

Laboratory Quality Assurance and Control

All sample analyses are to be performed within the holding time specified for each individual analysis noting any exceptions in the final report. Laboratory will follow the individual protocols specified by EPA for the analytical methods used.

Labs must report results of all internal laboratory QA/QC procedures such as lab blank, matrix spike, and surrogate analyses.

In addition to analytical results, analytical data sheets generated by the laboratory will each contain the following information: sample number and laboratory identification number, analysis method type or number, detection limits, and date of analysis.

The lab will document any problems it encounters regarding chain-of-custody, sample holding times, sample analyses, lab contamination, etc., and discussed in the analysis report.

Health and Safety

The sampling methodologies described in this plan are to be conducted in a safe manner using appropriate PPE and controls prescribed in the health and safety plan (HSP) prepared for anticipated cleanup activities at the Facility.

Workers involved in sampling will have successfully completed 40 hour training in accordance with 39CFR 1910.120 and completed a basic course in field sampling techniques. Workers will read and sign a copy of the SAP prior to the start of the field sampling

ALASKAN COPPER

Dangerous Waste Tank Closure Plan

Tank System Clean Closure Health and Safety Plan

Prepared by

CleanHarbors
ENVIRONMENTAL SERVICES®

19320 Des Moines Memorial Drive S
Building D, Suite 400
SeaTac, WA 98148

1.0 Introduction

The following Health and Safety Plan (HSP) serves to comply with current Federal Occupational Safety and Health Administration (OSHA) regulations. This plan specifically addresses hazardous waste site operations as prescribed in 29 CFR §1910.120,134, applicable sections of 29 CFR 1926 as well as pertinent Washington WISHA health and safety requirements under Chapter 296-155 - Part B-1

The Safety Manager may make additions or revisions to this plan as necessary and as project or site conditions warrant.

2.0 Positions and Responsibilities

Position	Responsibilities
Project Manager (PM)	1. Preparing and organizing project planning. 2. Selects site personnel and qualified labor. 3. Obtains work permits and site access. 4. Oversees on site response activities. 5. Approves appropriate material, supplies, and equipment. 6. Prepares daily work plan. 7. Issue personnel assignments prior to work start up. 9. Records and maintains site activity records and documentation. 10. Directs emergency response activities. 11. Interfaces with customer
Safety Manager	1. Establishes on site personal protective clothing criteria for each worker based on job function. 2. Determines appropriate respiratory protective level for each worker based on airborne contaminate type and the potential or duration of exposure. 3. Addresses all anticipated chemical and physical hazards associated with work along with adequate emergency contingencies based on known or suspected site conditions. 4. Updates health and safety planning based on actual site conditions encountered. 5. Monitors airborne contaminate levels at worker locations as well as CZ, CRZ and support zone locations to determine airborne contaminate levels and effectiveness of personnel protection and site wide airborne contamination control.
Forman	1. Manages field operations and reports to PM. 2. Executes the work plan and schedule. 3. Enforces safety procedures and serves as medical first responder. 4. Coordinates with the safety officer in monitoring and maintaining protection level. 5. Maintains site control. 6. Documents field activities and sample collection.

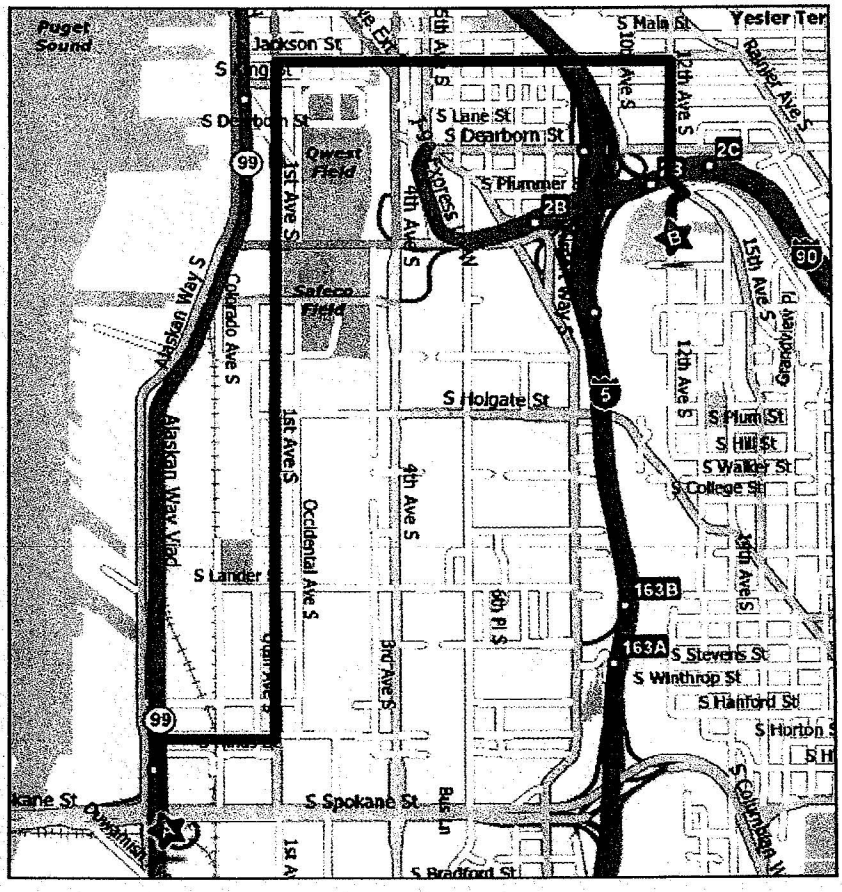
3.0 Emergency Contacts

Event	Contact	Emergency Number
All Emergencies	Outside Services	911
Spill, Chemical Release	Outside Services	911
Fire, Explosion	Outside Services	911
Injury	Outside Services	911
Agency Notification		360-407-6300
Client Contact		
Clean Harbors Contact		
MEDICAL FIRST RESPONDER	Outside Services	911

4.0 Hospital and Hospital Route

The hospital selected as the location to send suddenly ill or injured site workers is based on proximity. Alternate hospital(s) may be selected based on the specific situation and need of the patient. Figure 10 shows the shortest and most direct route to the designated hospital.

Pacific Hospital
1200 12th Ave S,
Seattle, WA
206-325-1357



5.0 Emergency Evacuation Procedures

Upon emergency notification the PM, site workers will immediately cease all work and proceed directly to the nearest exit as indicated above. Site personnel will meet at the assembly designated area. Contaminated PPE will be removed and placed into plastic bags at the assembly area.

6.0 Planned Activity Objectives

1. Removal or accumulated waste and facilitate proper disposal
2. Decontaminate storage tanks, process equipment and exposed surfaces
3. Decommission and remove Facility storage tanks, process equipment and process utilities.
4. Perform verification sampling of all tanks, process equipment and surfaces
5. Closure reporting

6.1 Safety Meetings

Before commencement of daily work, the PM will conduct a safety briefing. Participants will include all on-site workers, management staff, client representative, consultant, engineer, agent, subcontractors, agency officials and anyone else who may face exposure to the potential of on-site hazardous conditions. Safety meetings are intended to address:

1. Anticipated chemical and physical hazards relating to daily work.
2. Review safety practices and assignments given to each worker.
3. Discuss appropriate protective equipment necessary to promote the highest degree of safety for each worker.
4. Review specific personnel assignments.
5. Plan evacuation routes for sub-contracted personnel in the event of an emergency.
6. Review previous activities and suggestions for safety improvements.

Additional safety meetings may also be conducted should, in the opinion of the PM, additional review of safety procedures or suggestions become apparent.

6.2 Safety and Emergency Equipment Set Up

Health and safety equipment is to be set up or available in appropriate and readily accessible locations. Communication and emergency equipment will consist of the following minimum inventory.

1. PPE and appropriate safety gear
2. Emergency communication phone (2 way FM or cell phone)
3. First aid kit (including shock treatment and resuscitation gear)
4. Fire suppression equipment (ABC fire extinguisher)
5. Spill absorbent material including absorbent pads and pillows
6. Eye wash safety shower station(s)
7. Decontamination station(s)
8. Drinking water, lighting, and sanitation service (as needed)

6.3 Control Zone Set Up

The CZ boundary should extend no less than 10 feet beyond known contamination airborne concentrations at or exceeding PEL, potential for direct contact or physical hazard sources and will be delineated by red banner warning tape with postings affixed every 25 linear feet.

This minimum distance requirement is subject to change as conditions dictate. Activities within the CZ are to be restricted to hazard evaluation, isolation, control or remediation conducted by authorized persons.

The Contamination Reduction Zone (CRZ) may be established at selected locations adjacent to or surrounding the CZ to serve as a protective buffer zone between any airborne contamination risk or physical hazard sources and will be delineated by yellow banner tape.

6.4 Traffic Controls

Traffic cones and barriers with postings are to be used to route vehicle and pedestrian traffic around active work areas. "Do Not Enter", "Danger", and "Caution" notices are to contain project contact name, phone number, work scope and duration or starting and ending dates along with any special information such as use of applicable PPE, potential for odor or fumes.

6.5 Personnel and Equipment Decontamination Set Up

Decontamination Type	Location	Description
Personnel	All CZ and CRZ locations	Standard dry removal of outer PPE to designated waste disposal at each control zone egress location
Equipment	All CZ and CRZ locations where acid, caustic, or nuisance dust (silicon) contamination is present	Detergent wash of equipment exposed to contamination followed by clean water rinse or IPA wipe

6.6 Physical Hazard Evaluation and Control

Potential physical hazards and their applicable control measures are described in the following table for each task.

Location	Activity	Hazards	Precautions
Process Areas	Tank Decontamination	Chemical exposures Slip and trip	Wear required PPE Wear rubber boots, do not carry items across wet floor.
Open Sumps	Sump and Pad Decontamination	Trip and slip	Barriers around open pits Keep liquid off floor around sump and pad,
Decontamination	Power washing	Chemical exposures Pressure spray	Wear required PPE Avoid pointing sprayer

6.7 Chemical Hazard Evaluation

See attached MSDS's for most common site chemicals. An appropriate combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below published exposure levels.

Compound	Hazard Rating	PEL/REL/TLV	Notes
Nitric Acid	Corrosive Acid	4 ppm	
Hydrogen Fluoride (HF	Corrosive Acid	6 ppm	
Chromium 6	Corrosive Acid Toxic	.1 ppm (Inhalation)	
sodium hydroxide	Corrosive base / irritant	50 ppm liquid	

6.8 Personal Protection Levels

PPE	Location or Work Applicability	PPE Requirement	Additions/ Modifications
B	Confined spaces with toxic or insufficient atmosphere. Initial unknown container handling. Corrosive liquids. Backup and support for emergency response work during fire, explosion or spill.	Positive pressure, full face SCBA, hooded chemical resistant suit, chemical splash suit, gloves inner/outer, chemical resistant boots, boot covers, hard hat.	
C(X)	Inhalation hazard at or above designated action levels. Potential direct contact to skin or mucus membrane.	Full or half face air purifying respirator, wrap around safety glasses, chemical resistant suit, and gloves inner/outer, chemical resistant boots, hard hat.	Sarenex
D	Activities not associated with potential inhalation hazard or direct contact with hazardous substances or contamination.	Safety glasses, chemical resistance suit or rain gear (no respirator protection but within reasonable access).	

7.0 Action Levels

Exceeding the following conditions irrespective of location on site requires immediate shut down, work reassessment and modification of the HSP.

Contaminant	Action Level	Action Measure
Concrete Dust	Visual	Shut down, Re-assess PPE, wet surface
Vapor or fumes	Visual	Shut down, Re-assess PPE, apply neutralization agent or reassess
Shut down, wet surface or reassess	Odor	Shut down, Re-assess PPE, apply neutralization agent, flush with water or reassess

8.0 Standard Engineering Controls

Contamination (Work) Zone

CZ activities include the areas of hazardous material removal or work where both exposures to chemical or physical hazards are known or suspected to be present at or above OSHA PELS. The CZ also includes any area or work activity representing airborne expose potential, direct skin contact potential or visual residual accumulation potential resulting from certain work activities.

The CZ is to be clearly delineated by use of colored banner tape; temporary fencing; postings at adequate intervals; or physical obstacles sufficient in purpose to prevent or control entry.

Persons entering the CZ will wear Level C or higher level of protection and must also comply with the personnel protective, medical surveillance, and training provisions of this plan.

Reduction Zone

The contamination reduction zone (CRZ) is intended to serve as a buffer between the CZ and normal site conditions and can be any portion or contiguous area outside the CZ where concentrations of air, ground or water borne contaminants do not exceed regulatory permissible levels or pose physical human health hazards or risk to the environmental.

The CRZ is typically used for donning and removing PPE and for personnel and equipment decontamination.

The CZ is to be clearly delineated by use of colored banner tape; temporary fencing; postings at 25-foot intervals; or physical obstacles sufficient to restrict or direct entry. The CRZ may be repositioned if any of the following situations occur.

1. Creation of dust, vapors or fumes representing a health and safety hazard beyond the established CZ.
2. Planned activities requiring relocation of CZ.
3. Windy or rainy conditions giving rise to the potential spread of airborne or impacted soil contaminates beyond the CZ.
4. Discovery or work with hazardous substances having potential for release beyond the CZ.

Support Zone

The support zone (SZ) covers all areas outside and accessible to the CRZ or CZ. Contaminated clothing and equipment are not allowed in the support zone. Personnel shall remove all contaminated protective clothing before exiting from the CRZ.

Supplies needed for immediate use such as spare respirator cartridges, air supply tanks, shovels, pumps and hoses shall be stored at the personnel and equipment decontamination area adjacent to the contamination zone. The boundary between the CRZ or CZ and the support zone(s) shall be clearly indicated by use of yellow warning tape or physical barriers.

9.0 Monitoring

The PM or designate will perform environmental monitoring as described below and implement action level procedures as indicated below.

Type	Method	Location	Frequency	Tasks	Action Level
LEL	4 gas	Tanks Interiors	Initial Opening	Demolition Decontamination	See LEL
Explosion Hazard ≤10% LEL: Continue work in accordance with action levels for other instruments; monitor continuously for combustible atmospheres. >10% LEL: Evacuate area; eliminate ignition sources; reassess conditions.					
Gases	4 gas	Tanks Interiors	Initial Opening	Demolition Decontamination	See LEL
Unknown Vapors Background to 1 ppm: Level D. 1 to 5 ppm above background: Level C. 5 to 500 ppm above background: Level B. >500 ppm above background: Level A					
O2 Toxic	4 gas	Tanks Interiors	Initial Opening	Demolition Decontamination	See LEL
Oxygen <19.5% or >25.0%: Evacuate area; eliminate ignition sources; reassess conditions.					
Surveillance					
Visual heat stress and fatigue					

* Unless otherwise stated, airborne contaminant concentrations are measured as a time-weighted average in the worker's breathing zone. Acceptable concentrations for known airborne contaminates will be determined based on OSHA/NIOSH/ ACGIH and/or NRC exposure limits.

On-site monitoring is conducted whenever there is a potential for hazardous substances exposure to site workers, the general public or environmental receptors. Monitoring may consist of real time automatic sensory equipment; direct reading personnel monitors, hand pump sampling devices, or combination. On site monitoring procedures and equipment are to be designed and chosen specifically for detecting contaminants known or suspected to be present and that can provide essential information in determining selection or change in PPE or remedial methodology.

Monitoring procedures include contamination zone and reduction zone airborne contaminant monitoring; ambient air monitoring at or near the perimeter of work areas; personnel monitoring during potential exposure to contaminated media or situations (soils, liquids, vapors, flammable or minimal oxygen atmospheres, etc.); and continuous monitoring of high risk employees during and after clean up operations. At a minimum, air monitoring should be conducted under the following conditions:

1. Required by federal or state health and safety regulations
2. Upon initial entry to identify IDLH conditions
3. Part of determining PPE selections
4. Start of each new or different type of work activity or location
5. Whenever an environmental change necessitates modification in activity or personal protection

Facility process environment and chemical use will be reviewed prior to commencement of work to assist in determining the appropriate type of monitoring procedures necessary to ensure worker safety. The Safety Manager should identify specific locations where air monitoring can be performed effectively. Should monitoring indicate a need for change in personnel protection levels within or be detected outside established control zones the PM will immediately implement corrective actions such dust suppression or cessation of work.

Environmental Monitoring

Ambient monitoring for targeted airborne contaminants should be performed at predetermined intervals or continuously at locations where airborne contaminants are known or suspected to be present. Monitoring should be conducted upwind and downwind simultaneously in relation to contamination sources prior to and during on site activities. Established monitoring procedures may be modified in the event of a change in environmental conditions or upon discovery of new contaminant sources. All monitoring data is typically collected and recorded as directed by the Safety Manager and becomes part of the overall site record.

Personal Monitoring

conducts personal monitoring of personnel working in or around areas having the highest degree of exposure to confirm PPE selection and work methodology. Personal monitoring should also coincide with activities performed in areas where airborne contaminates have not been fully determined or are suspected of exceeding established levels of respiratory protection.

Heat Stress Monitoring

All indications of heat related the designated on-site first aid responder should treat fatigue immediately. Specific training covering heat related illness is made part of the initial training received by all employees. Site workers should be provided with balanced electrolyte solutions to replace fluids and lost electrolytes.

Site workers should also be encouraged to drink large quantities of liquids even though they may not feel thirsty if heat conditions exist. Liquids such as Gatorade are to be made available at all times during hot or humid conditions. All rest breaks are to be taken out of the exclusion zone in a cool, shaded rest area or in an air-conditioned environment if required.

If heat stress does become an issue, this plan will be modified to implement the appropriate measures. Medical monitoring of personnel wearing protective clothing should be intensified when the ambient temperature is 70F or above. To monitor the worker, one of the following methods should be employed:

1. Measure pulse for a 30 second period as early as possible in the rest period. If the pulse rate exceeds 110 beats per minute, shorten the next work cycle by one-third and keep the rest period the same. If the pulse rate still exceeds 110 beats per minute at the next rest period, shorten the following cycle by one-third.

2. Oral temperature should be measured at the end of the work period (before drinking). If oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period. If the oral temperature still exceeds 99.6°F at the beginning of the next rest period, shorten the next work cycle by one-third. Do not permit a worker to wear a semi-permeable or impermeable garment when his/her oral temperature exceeds 100.6°F.

Cold Stress Work /Rest Schedules

Work/rest schedules must be altered to minimize the potential for cold stress. Cold stress is defined as a decrease in core body temperature to 96.8°F and/or cold injury to body extremities. Decrease in core body temperature is associated with reduced mental alertness, reduction in rational decision-making, or loss of consciousness in severe shivering. If workers experience these symptoms, then stop work and implement the following controls

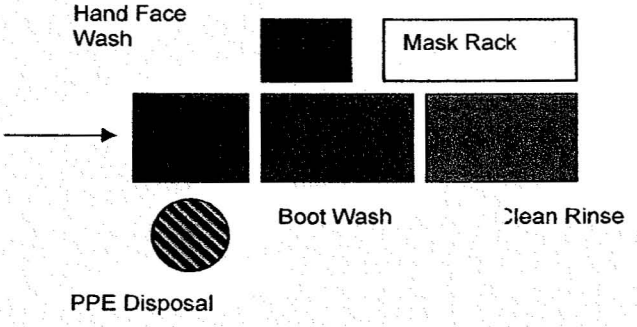
1. Workers must don adequate dry insulating clothing; and
2. Adjust the work/rest schedule to increase the amount of rest/re-warming time.
3. Toolbox safety meetings discussing symptoms of cold stress, clothing requirements, and work breaks must be held when the wind chill temperature is below 25°F.

10. Decontamination

All decontamination activity should be conducted on an impermeable surface sufficient for containing both dry and liquid contaminates. Accumulated decontamination solutions and associated debris should be removed at the end of each workday and placed into DOT approved containers for off site disposition.

Personal	Equipment	Respirators
At designated decontamination stations, workers will first remove all gross contamination form outer protective clothing followed in order with removal of outer gloves, hard hat, tyvek and outer boots. Facemask can then be removed. Wash hands then face followed by a thorough rinsing. All items not intended for disposal should be cleaned immediately after use.	Washing or wiping with mild detergent and water will decontaminate mechanical equipment or hand tools used in connection or having come in direct contact with contaminated. Pressure wash if necessary. No visual signs of contamination should be allowed to remain on equipment or tools of any type when removing from the designated CZ or CRZ.	All respirators, supplied air equipment, and personal protective equipment shall be cleaned at the end of each shift using a commercial cleaning solution following with a thorough rinse. Respirator components suspected of being permeated by contamination shall be immediately discarded and replaced.

10.1 Standard Decontamination Station Set Up



11. Standard Safety Practices (SOP)

Health and Safety Meetings

Prior to commencement of work, daily pre entry briefings will be conducted and documented. These meetings are to address anticipated hazards to be encountered, protective equipment use, emergency and evacuation procedures, evacuation safe zones, and general review of specific safety practices for each task assignment.

First Aid

Emergency first aid supplies will be located within 50 feet of all active work areas. Emergency treatment instructions for chemical exposure and physical injury are provided in the emergency contingency plan and will be kept on site during work hours.

Buddy System

All on site workers shall work in groups of at least two and shall conduct all activities in such a manner that each worker is observed at all times by at least one other worker. At no time will work be conducted so as to inhibit one or more co-workers from providing immediate and effective assistance or removing a health or life threatening condition.

Communications

Direct, on line communications shall be readily available at all times and located within 300 feet of all active work areas. All employees shall have been trained in the proper emergency communication procedures while wearing their protective equipment; this may include hand signals or portable audio equipment. Employees shall also be instructed in the proper response and communications for emergency conditions.

Lockout/Tagout

Site workers will follow written procedures found in the CHES lockout/tagout guidelines

Fall Protection

OSHA approved methods of fall protection are required under the following conditions:

1. Work (4) feet or more above the ground.
2. Work in a man-lift higher than six feet above ground.
3. Involves assembly/disassembly of scaffolds, work platforms or temporary surfaces.
4. Ladder work over 6 feet from surface
5. Work over dangerous equipment/conditions.
6. Working within six feet of an unprotected edge of a floor/wall opening or roof.

Noise Protection

Site workers, who are engaged in heavy equipment operation; working within 20 feet of gas driven or pneumatic equipment while in operation; or during any activities where normal voice communication cannot be distinguished over background noise, shall wear adequate noise protection.

Fire Prevention

All storage and handling of flammable materials shall be in areas located away from ignition sources or excessive heat. Flammable containers shall be kept closed and secured. Electrical equipment shall not be used around areas where flammable materials are stored or the potential of fire or explosion may exist. Appropriate portable fire extinguishers shall be located within 50 feet from active work areas at all times. If available, water sources will be identified and utilized for fire fighting via pumps, hydrants, tankage, etc. All flammable and combustible spilled materials will be cleaned up immediately. Rags, trash, tall grass, and piled combustible materials will be removed or isolated away from active work areas.

Smoking, Eating, Drinking

Smoking, eating, or consuming beverages is prohibited within CZ or CRZ zones.

Hygiene

Exposed street clothes may not be worn into contamination or reduction zone. Beards and long side burns shall not be allowed if worker is required to wear protective face gear.

Clothing worn on the site whether worn underneath protective clothing or within the support zone shall not be washed with any other clothing.

Site workers need to shower immediately on returning to lodging or home.

Attire

Personal protective clothing or articles that have been torn or frayed or are overly lose shall be immediately replaced or taped in such a manner as to prevent articles from being caught in moving machinery or equipment.

Safety Practice Improvements

Safety practice improvements, suggestions or concerns of any nature need to be brought the immediate attention of the Project Manager. Anyone, irrespective of position has the authority to order the immediate shut down of any site operation by signaling to cease work.

Reporting of Incidents and Accidents

All accidents or injuries regardless of the nature or location shall be reported immediately to the site safety officer or company regulatory officer engaged in on site activities. Any incident resulting in loss of work or requiring an examination by a physician shall be documented on the incident reporting form and shall be submitted to the regulatory officer within 12 hours. The Project Manager shall be responsible for ensuring that a comprehensive investigation is made of all lost time accidents or injuries.

Sanitation Services, Lighting, and Potable Water Availability

Appropriate toilets or latrines will be provided for all on site personnel in accordance with OSHA requirements. Adequate lighting is required for all on site work. For purposes of this plan, the Project Manager or Health and Safety Officer shall determine adequate lighting. Potable water will be supplied as needed should the potential of heat stress be a factor. The Project Manager or field team leader will make necessary arrangements for fresh potable water sources.

Container Handling and Opening

It may necessary to move, handle, or dispense a variety of containers that may have been discovered or stored on site for extended periods. Containers should be inspected and contents identified in level B prior to handling or movement if: (1) Contents are not already known and do not require enhanced level of personal protection. (2) Containers are unlabeled and adequate content information is not available. (3) Containers with labeling not consistent with visual evidence, historical information, or knowledge of processes or where there is a reason to suspect inappropriate labeling.

Container opening and handling procedures shall include under level B conditions a minimum of two workers in supplied air (SCBA) with one person acting as backup in the event of an emergency. In all cases personnel must be kept at a safe distance or behind protective shielding should the possibility of detonation be suspected. Only non-sparking tools and equipment shall be used to handle or open containers of flammable or unknown content.
If possible, use remote means of container opening such as backhoe with bronze puncture attachment. Apply mechanical or tool assisted means of opening or container movement to minimize worker exertion. Containers showing signs of swelling or bulging should be relieved of pressure by loosening bungs or rings and allowing equalization of internal pressure to atmosphere. Placement of a protective barrier to deflect expelled gas, liquid or solids is recommended. Containers having risk or rupture, leakage, or spillage should be emptied into a DOT approved 85-gallon salvage drum using a portable hand pump (for liquid wastes) or a hand shovel (for solids and sludge).

Drums may be moved using a grappler, non-metallic slings, backhoe bucket, front-end loader, or by other means that will minimize damage to containers and release of contents. Additional over-pack units, in addition those required to over-pack the drums, should be provided on site adjacent to the staging area and each active excavation area.

Monitoring for toxic vapors, dusts or fumes using equipment such as colormetric tubes, dosimeters, organic vapor analyzers or combustibility meters should be conducted during opening of containers where contents are not known. Containers suspected of containing explosive or shock sensitive materials must be handled with extreme caution. Ensure all non-essential personnel have moved to a safe distance. Use mechanical grappling units constructed for explosive containment for initial handling. Palletize containers prior to transport. Use audible siren signal system similar to that employed in conventional blasting operations. Maintain continuous communication with the site safety officer until handling operations are complete.

Leaking or deteriorated container contents should be transferred into non-leaking containers using non-sparking pumping or bucketing techniques. Over-packing should be used where container condition indicates potential rupture or integrity failure during extended movement or off site transportation. Level C protection may be used if sufficient information is known about container contents. Sufficient information may be in the form of historical or processing data, personal knowledge of the waste type and characteristics, container appearance or condition and surrounding environment that lends to level C.

Minimum Requirements for Working in Confined Space

Confined space work will be conducted in accordance with applicable sections of 29CFR 1910.146. Site-specific confined space entry and activities shall be planned and evaluated in advance by the entry team covering a review of communication signals and emergency contingencies, personal protection requirements, and general precautions. Only those personnel that have completed a confined space entry field test shall be allowed to engage in on site confined space entry. Employees shall not be allowed to enter atmospheres in a confined space which has or is suspected of having contained toxic, flammable or corrosive materials or reduced or elevated oxygen levels until such space has been evaluated, tested, and deemed safe for entry by qualified personnel. A pre entry checklist shall be used and will include the following items:

1. Type of monitoring conducted as well as time and location of test.
2. Type of testing equipment used.
3. Hazardous characteristics and concentrations.
4. Air movements and weather conditions.
5. Condition of entry and accessibility and planned work activity.

Confined space toxicity, flammability, oxygen deficiency, noise, temperature, vapor pressures, ventilation rates, and ignition sources shall be considered in determining safe entry. Chemical and physical hazards must be removed or reduced if possible before entry.

This may include vapor freeing or inerting, providing ventilation; chemical neutralizing, ignition source elimination, intrinsically safe lighting, or any measure(s) that enhances safe entry or reduces expose during confined space work. Monitoring confined space atmosphere shall be conducted on a continuous basis.

Entry permit expires at the time of shift change or when confined space activities change. If work in confined spaces under level B is required, a maximum of 20 minutes work with 10-minute rest intervals is allowed. A maximum of 4 total hours in Level B for every 6 hours of contamination zone work is recommended. At a minimum entry personnel shall stay in visual contact with support personnel. Entry personnel shall wear safety harasses with lifelines if situations require isolation, lost of visual contact, in confined space area where highly toxic, flammable or oxygen deficient conditions can develop.

ALASKAN COPPER

Dangerous Waste Tank Closure Plan

Tank System Clean Closure Emergency Contingency Plan

Prepared by

CleanHarbors
ENVIRONMENTAL SERVICES®

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SeaTac, WA 98148

1.0 Preparedness

During daily and weekly safety meetings, the Project Manager will instruct and assign response and communication duties for selected site workers in the event of an emergency. Specific duties will be assigned during daily safety meetings.

The Project Manager will evaluate environmental conditions daily and determine response actions, goals, and specific worker assignments for each day. Emergency equipment set up detailed in the Closure Plan shall be inspected and maintained on a daily basis by the Project Manager or designate.

Copies of the emergency phone listing found on the first page of the HSP should be posted at each entrance to the work site along with the name and location of the emergency medical first responder.

1.1 Communication Signals

The Project Manager and foreman will utilize portable compressed air horns or other broadcast means in the event of any of the following emergency situations. The site foreman or team leader will be in continuous visual contact with response personal engaged in field tasks. All response personnel as well as subcontracted services personnel will be knowledgeable of emergency response signals and hand signals called for in this plan.

Emergency Situation	*Signal*
Personal Injury/Man Down	1 Blast
Material spill or chemical releases	2 Blasts
Fire and or explosion	3 Blasts
Evacuate	Continuous Blast

Signals	*Response*
Grip partners wrist or waist	Leave area immediately
Hands on top of head	Needs assistance
Thumbs up	Yes / OK
Thumbs down	No / Not OK
Fist closed, arms raised	Stop

2.0 Response Procedures

Chemical Spill and Chemical Release

For controlled and identified material spillage the Project Manager will direct the containment around the release based using adsorbents, berming or other means such as diversion pumping to remedy controllable spillage. Clean up of spilled contaminants shall take precedence over normal scheduled on site work activities. For unidentified or uncontrolled material spillage the Project Manager or Safety Manager shall immediately notify or designate someone to notify the state and federal agencies listed in front of the site safety plan. The Project Manager may stop all normal work operations and take all necessary measures to mitigate the hazard presented by the release of contamination.

Fire/Explosion

The presence of ignitable and combustible liquids used for fuel and the ever-present danger of uncovering ignitable or reactive substances creates a potential for an explosion or fire. It is policy to maintain limited on site fire fighting capability. The capability is specifically designed to bridge the gap from notification until the local fire department arrives.

Site workers are not specifically trained or equipped to engage a major fire or explosion incident; therefore this plan would remain in effect only until the local fire department arrives on scene. Once professional fire fighting personnel arrives on scene, site workers will remain at the disposal of the incident commander in charge. No one will perform interior structural fire fighting or undertake operations regulated by OSHA's fire brigade standard (1910.156). The primary response of site personnel will be to leave the immediate fire area and then attempt to contain the fire, prevent further spread and attend the needs of any injured personnel until help arrives.

1. Location of emergency
2. Description of emergency
3. Conditions that may require special rescue equipment, such as confined spaces. excavations, and elevated work platforms
4. Potential chemical hazards and recommended PPE

Injury or Sickness

The designated first aid responder will take appropriate following actions:

1. Assess the nature of the injury or illness.
2. Order outside emergency services if required.
3. Control and stabilize illness or injury to the extent possible.
4. Treat for shock.

If the nature of the injury appears, or is suspected to involve the back or neck areas, the injured shall not be moved unless the surrounding environment poses an imminent threat to life or further injury. Only properly medically trained personnel shall attempt to move someone suffering from a suspected back or neck injury.

Chemical Exposure

Personnel having skin contact with contaminated liquids or soils shall be flushed with water and or any wet or soiled clothing removed. These personnel shall be observed by the health and safety officer to ascertain whether there are any symptoms resulting from exposure. If there is any visible manifestation of exposure such as skin irritation, project personnel will be examined by a physician. Episodes of obvious chemical contamination are to be reviewed by the Health and safety officer in order to determine whether changes are needed in work procedures.

If inhalation occurs, personnel will be removed from the contaminated atmosphere. Artificial respiration and transportation to the nearest hospital will be provided if necessary. If ingestion occurs, a physician will evaluate personnel.

Emergency Decontamination

The purpose of emergency decontamination is to either remove the patient from the source of contamination or remove the contamination source away from the patient. This will reduce the possibility of further injury or threat to the patient as well as reduce the risk to emergency medical response personnel. Before proceeding with decontamination, an appraisal of the contamination source and type must be made to insure adequate measures are in place to protect all personnel assisting in removal of the patient from the scene and those assisting in the decontamination process. Personnel attempting to approach or remove a patient away from a contamination source must be fully protected. The following procedures are to be considered during emergency decontamination efforts.

1. Don protective face protection and clothing.
2. Move patient either left or right of the direction of wind or move the source of contamination left or right of the wind direction away from the patient.
3. Remove patient's outer protective clothing and all other clothing that may have come in contact with contaminants.
4. Move patient to the wash station and wash the affected skin area with water for at least 15 minutes.
5. Flush the eyes with copious amounts of water (eyewash solution will also be available) if the eyes come into contact with contaminated materials.
6. All eye and mucus membrane related injuries would require immediate transport to the local medical care center for evaluation and treatment.

ACKNOWLEDGMENTS

The following individuals have read and understand the Attached Work Plan, Site Safety/Health Plan and Emergency Contingency Plan and agree to abide by all terms and condition set herein.

Name	Representing	Signature	Date